

RESEARCH, DEVELOPMENT & TECHNOLOGY TRANSFER QUARTERLY PROGRESS REPORT

Wisconsin Department of Transportation
DT1241 02/2011

INSTRUCTIONS:

Research project investigators and/or project managers should complete a quarterly progress report (QPR) for each calendar quarter during which the projects are active.

WisDOT research program category: <input type="checkbox"/> Policy research <input type="checkbox"/> Other		<input checked="" type="checkbox"/> Wisconsin Highway Research Program <input type="checkbox"/> Pooled fund TPF#	Report period year: 2013 <input type="checkbox"/> Quarter 1 (Jan 1 – Mar 31) <input type="checkbox"/> Quarter 2 (Apr 1 – Jun 30) <input checked="" type="checkbox"/> Quarter 3 (Jul 1 – Sep 30) <input type="checkbox"/> Quarter 4 (Oct 1 – Dec 31)
Project title: Aesthetic Coatings for Concrete Bridge Components			
Project investigator: Dr. Al Ghorbanpoor		Phone: 414-229-4962	E-mail: algh@uwm.edu
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WisDOT project ID: 0092-13-05		Other project ID:	Project start date: 8/22/2012
Original end date: 11/21/2014		Current end date: 11/21/2014	Number of extensions: 0

Project schedule status:

☐ On schedule ☐ On revised schedule ☐ Ahead of schedule ☒ Behind schedule

Project budget status:

Total Project Budget	Expenditures Current Quarter	Total Expenditures	% Funds Expended	% Work Completed
\$120,000.00	\$3,000.00	\$34,000.00	28%	35%

Project description:

The objectives of this study are to investigate methods and products that may be used in the aesthetic and protective coating of bridge concrete components and to develop a guideline for cost-effective bridge coating practices for concrete members. A series of concrete coating systems will be identified and tested in the laboratory to evaluate their performance under simulated environmental conditions that are similar to those experienced by bridge components in Wisconsin. Wisconsin bridge sites, where coating failures and problems have occurred, have been visited to identify and evaluate the structural details and other factors that have contributed to such coating failures. Upon completion of the testing and evaluation program, guidelines and specifications language will be developed for selection, application, and maintenance of such coating materials.

Progress this quarter (includes meetings, work plan status, contract status, significant progress, etc.):

The research team prepared samples for coating application by performing a 3500 psi water blast on all sample surfaces. However, the high pressure water blast exposed additional surface voids below the initial surface. In order to eliminate these voids an additional sack rubbing of the surface was performed, which required the samples to cure for another 28 days before the water blasting surface preparation could once again be completed.

During the curing period the outdoor testing rack was constructed (Figure 1), and an automated spraying system for the sodium chloride solution was developed and constructed.



Figure 1: Outdoor Testing Rack

Once the samples were properly cured, application of the coating systems was initiated. However, the heavier coating thicknesses required could not be obtained with a uniform thickness using roller application. The thinning limitations on some of the coatings (specifically Sherwin Williams Ultracrete) prevented the application with available spray equipment. Spray application for all systems was thoroughly explored, but no system was available to apply the high solid content systems with a uniform surface of recommended thickness. Therefore, it has been decided for the systems which allow thinning or have the proper viscosity to use a conventional spray system to achieve a uniform thickness. All other coating systems (2 systems) will be applied by brush/roller in multiple layers to make sure achieving a uniform coating with the recommended thickness. A test sample (Figure 2) with successfully achieving the appropriate coating thickness through using brush/roller application is shown below.



Figure 2: Roller Applied Coating Sample

Anticipated work next quarter:

Finish coating application and begin all experimental testing.

Circumstances affecting project or budget:

Additional sack rub treatment of samples and additional time was required after initial water blast (including 28 day curing period).

Extensive efforts and time were needed to determine appropriate means of applying various coating systems with varying viscosity levels (as describes above).

Attach / insert Gantt chart and other project documentation

Quarters/Tasks	1	2	3	4	5	6	7	8	9
1. Literature Review	<div></div>								
2. Survey	<div></div>								
3. Interim Report	<div></div>								
4. Laboratory Testing				<div></div>					
5. Future Research						<div></div>			
6. Project Deliverables								<div></div>	

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Staff receiving QPR: K. Dinkins	Date received: 09/30/2013
Staff approving QPR:	Date approved: